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#B9-003, GANGA, Jnanabharathi Enclave,
Valagerahalli, Mysore Road, Bangalore 560059
Ph: 9448853634, 8762194386.
Email: sapiencebangalore@gmail.com

JobNo: SCE/BBMP/RL/17/2020-2021

Date 01.03.2021

TEST RESULTS OF AGGREGATE SHAPE TEST (Flakiness & Elongation)

Client : : Executive Engineer, RR Naga Division,BBMP, Bangalore.
Agency: : Sri. R Lokesh, Contractor, Bangalore.
Name of work: Compreshensive development of roads and drains in Muthyalanagara, LC-4A, Mohankumarnagara, Sundar nagara and surrounding areas in ward no-17 under PACKAGE-2019-20 RRN-DIV-(09)

BIS Code: IS 2386 Part (1):1963
Date of Test: 01.03.2021
Type of Mix: Dense Graded Bituminous Macadam

Sl.No.	Flakiness Index Value(%)	Elongation Index Value(%)	Total(Combined Flakiness and Elongation)(%)	Requirements
1	11.80	10.30	22.10	Maximum allowable Combined Flakiness and Elongation Indices for Dense Graded Bituminous Macadam is 35% as per Table 500.8 MORTH Specification.
2	12.90	13.60	26.50	

Note:

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Asst. Executive Engineer
Yeshwanthpura Sub-Division
Bruhat Bangalore Mahanagara Palike

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Job No.: SCE/BBMP/RL/17/2020-2021

Date: 03.03.2021

Specific Gravity And Water Absorption Test

Client	**: Executive Engineer,** RR Naga Division,BBMP, Bangalore.
Agency	**: Sri. R Lokesh,** Contractor, Bangalore.
Name of the Work	Compreshensive development of roads and drains in Muthyalanagara, LC-4A, Mohankumarnagara, Sundar nagara and surrounding areas in ward no-17 under PACKAGE-2019-20 RRN-DIV-(09)
BIS Code	IS 2386(Part 3):1963
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	01.03.2021 to 03.03.20.21

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2021	2023	2022	
2	Weight of basket suspended in water	W_2 g	754	754	754	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1267	1269	1268	
4	Weight of saturated surface dry aggregate in air	W_3 g	2017	2016	2015	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	750	747	747	
6	Weight of oven dried aggregate	W_4 g	2007	2008	2005	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.676	2.688	2.684	2.683
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.712	2.717	2.720	2.717
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.50%	0.40%	0.50%	0.47%

Comments:

→ Maximum allowable Aggregate Water absorption value for Dense Graded Bituminous Macadam is 2.0%(As per MORTH table 500.8)

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Job No.: SCE/BBMP/RL/17/2020-2021

Date: 08.03.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX AASHTO T 164 & AASHTO T 30

Client	: Executive Engineer, RR Naga Division,BBMP, Bangalore.
Agency	: Sri. R Lokesh, Contractor, Bangalore.
Name of the Work	Compreshensive development of roads and drains in Muthyalanagara, LC-4A, Mohankumarnagara, Sundar nagara and surrounding areas in ward no-17 under PACKAGE-2019-20 RRN-DIV-(09)
Date of Testing	08.03.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477.1	477.3
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	22.90	22.70
7. Bitumen content in %	4.58	4.54
8. Average	4.56	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	31.1	31.1	6.5	93.5	90 - 100
19	73.3	104.4	21.9	78.1	71 - 95
13.2	66.9	171.3	35.9	64.1	56 - 80
4.75	82.2	253.5	53.1	46.9	38 - 54
2.360	76.6	330.1	69.2	30.8	28 - 42
0.300	95.5	425.6	89.2	10.8	7 - 21
0.075	22.2	447.8	93.9	6.1	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	36.6	36.6	7.7	92.3	90 - 100
19	73.3	109.9	23.0	77.0	71 - 95
13.2	65.5	175.4	36.7	63.3	56 - 80
4.75	85.50	260.9	54.7	45.3	38 - 54
2.360	75.5	336.4	70.5	29.5	28 - 42
0.300	98.8	435.2	91.2	8.8	7 - 21
0.075	22.2	457.4	95.8	4.2	2 - 8

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Yeshwanthpura Sub-Division
Bruhat Bangalore Mahanagara Palike

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Job No.: SCE/BBMP/RL/17/2020-2021

Date: 09.03.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX AASHTO T 164 & AASHTO T 30

Client	: Executive Engineer, RR Naga Division,BBMP, Bangalore.
Agency	: Sri. R Lokesh, Contractor, Bangalore.
Name of the Work	Compreshensive development of roads and drains in Muthyalanagara, LC-4A, Mohankumarnagara, Sundar nagara and surrounding areas in ward no-17 under PACKAGE-2019-20 RRN-DIV-(09)
Date of Testing	09.03.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477.3	477.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	22.70	22.50
7. Bitumen content in %	4.54	4.50
8. Average	4.52	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.10
37.5	0	0	0	100	100
26.5	33	33	6.9	93.1	90 - 100
19	71.1	104.1	21.8	78.2	71 - 95
13.2	65.5	169.6	35.5	64.5	56 - 80
4.75	80.2	249.8	52.3	47.7	38 - 54
2.360	75.5	325.3	68.2	31.8	28 - 42
0.300	96.6	421.9	88.4	11.6	7 - 21
0.075	21.1	443	92.8	7.2	2 - 8

SIEVE SIZE	Test 2				
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.10
37.5	0	0	0	100	100
26.5	35.5	35.5	7.4	92.6	90 - 100
19	72.2	107.7	22.6	77.4	71 - 95
13.2	65.5	173.2	36.3	63.7	56 - 80
4.75	75.50	248.7	52.1	47.9	38 - 54
2.360	85.5	334.2	70.0	30.0	28 - 42
0.300	95.5	429.7	90.0	10.0	7 - 21
0.075	23.3	453	94.9	5.1	2 - 8

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Yeshwanthpura Sub-Division
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Job No.: SCE/BBMP/RL/17/2020-2021

Date: 10.03.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX
AASHTO T 164 & AASHTO T 30

Client	: Executive Engineer, RR Naga Division,BBMP, Bangalore.
Agency	: Sri. R Lokesh, Contractor, Bangalore.
Name of the Work	Compreshensive development of roads and drains in Muthyalanagara, LC-4A, Mohankumarnagara, Sundar nagara and surrounding areas in ward no-17 under PACKAGE-2019-20 RRN-DIV-(09)
Date of Testing	10.03.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477	477.3
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	23.00	22.70
7. Bitumen content in %	4.60	4.54
8. Average	4.57	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	25.5	25.5	5.3	94.7	90 - 100
19	73.3	98.8	20.7	79.3	71 - 95
13.2	66.5	165.3	34.7	65.3	56 - 80
4.75	82.2	247.5	51.9	48.1	38 - 54
2.360	76.6	324.1	67.9	32.1	28 - 42
0.300	95.5	419.6	88.0	12.0	7 - 21
0.075	22.2	441.8	92.6	7.4	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	36.6	36.6	7.7	92.3	90 - 100
19	82.2	118.8	24.9	75.1	71 - 95
13.2	64.4	183.2	38.4	61.6	56 - 80
4.75	76.60	259.8	54.4	45.6	38 - 54
2.360	80.2	340	71.2	28.8	28 - 42
0.300	96.6	436.6	91.5	8.5	7 - 21
0.075	22.2	458.8	96.1	3.9	2 - 8

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Date: 11.03.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX AASHTO T 164 & AASHTO T 30

Client	: Executive Engineer, RR Naga Division,BBMP, Bangalore.
Agency	: Sri. R Lokesh, Contractor, Bangalore.
Name of the Work	Compreshensive development of roads and drains in Muthyalanagara, LC-4A, Mohankumarnagara, Sundar nagara and surrounding areas in ward no-17 under PACKAGE-2019-20 RRN-DIV-(09)
Date of Testing	11.03.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477.4	477.1
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	22.60	22.90
7. Bitumen content in %	4.52	4.58
8. Average	4.55	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	23	23	4.8	95.2	90 - 100
19	72.2	95.2	19.9	80.1	71 - 95
13.2	65.5	160.7	33.7	66.3	56 - 80
4.75	80.2	240.9	50.5	49.5	38 - 54
2.360	75.5	316.4	66.3	33.7	28 - 42
0.300	96.6	413	86.5	13.5	7 - 21
0.075	23	436	91.3	8.7	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	35.5	35.5	7.4	92.6	90 - 100
19	83.3	118.8	24.9	75.1	71 - 95
13.2	65.5	184.3	38.6	61.4	56 - 80
4.75	72.20	256.5	53.8	46.2	38 - 54
2.360	82.2	338.7	71.0	29.0	28 - 42
0.300	96.5	435.2	91.2	8.8	7 - 21
0.075	23.3	458.5	96.1	3.9	2 - 8

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Job No.: SCE/BBMP/RL/17/2020-2021 Date: 08.03.2021

TEST REPORT ON STABILITY OF MIX

Client	:	: **Executive Engineer,** RR Naga Division, BBMP, Bangalore.
Agency	:	: **Sri. R Lokesh,** Contractor, Bangalore.
Name of the Work	:	Compreshensive development of roads and drains in Muthyalanagara, LC-4A, Mohankumarnagara, Sundar nagara and surrounding areas in ward no-17 under PACKAGE-2019-20 RRN-DIV-(09)
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	08.03.2021

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.42	9.25	9 Kn (min)
2	Marshal flow, mm	3.84	3.56	2 – 4
3	Percent air voids in Mineral Aggregate	14.78	13.89	13 – 15
4	Voids in Compacted Mix	3.6	3.73	3 – 6
5	Percent Voids filled with Bitumen	67.74	69.52	65 - 75
6	Density, g/cc	2.27	2.27	--

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Job No.: SCE/BBMP/RL/17/2020-2021 Date: 09.03.2021

TEST REPORT ON STABILITY OF MIX

Client	:	**: Executive Engineer,** RR Naga Division, BBMP, Bangalore.
Agency	:	**: Sri. R Lokesh,** Contractor, Bangalore.
Name of the Work	:	Compreshensive development of roads and drains in Muthyalanagara, LC-4A, Mohankumarnagara, Sundar nagara and surrounding areas in ward no-17 under PACKAGE-2019-20 RRN-DIV-(09)
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	09.03.2021

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.87	9.89	9 Kn (min)
2	Marshal flow, mm	3.71	3.36	2 – 4
3	Percent air voids in Mineral Aggregate	14.52	13.52	13 – 15
4	Voids in Compacted Mix	3.52	3.84	3 – 6
5	Percent Voids filled with Bitumen	67.65	69.63	65 - 75
6	Density, g/cc	2.26	2.25	--

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Job No.: SCE/BBMP/RL/17/2020-2021 Date: 10.03.2021

TEST REPORT ON STABILITY OF MIX

Client	:	**: Executive Engineer,** RR Naga Division, BBMP, Bangalore.
Agency	:	**: Sri. R Lokesh,** Contractor, Bangalore.
Name of the Work	:	Compreshensive development of roads and drains in Muthyalanagara, LC-4A, Mohankumarnagara, Sundar nagara and surrounding areas in ward no-17 under PACKAGE-2019-20 RRN-DIV-(09)
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	10.03.2021

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.56	9.65	9 Kn (min)
2	Marshal flow, mm	3.32	3.32	2 – 4
3	Percent air voids in Mineral Aggregate	14.42	13.25	13 – 15
4	Voids in Compacted Mix	3.89	3.63	3 – 6
5	Percent Voids filled with Bitumen	67.63	69.41	65 - 75
6	Density, g/cc	2.28	2.26	--

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Job No.: SCE/BBMP/RL/17/2020-2021 Date: 11.03.2021

TEST REPORT ON STABILITY OF MIX

Client	:	: **Executive Engineer,** RR Naga Division, BBMP, Bangalore.
Agency	:	: **Sri. R Lokesh,** Contractor, Bangalore.
Name of the Work	:	Compreshensive development of roads and drains in Muthyalanagara, LC-4A, Mohankumarnagara, Sundar nagara and surrounding areas in ward no-17 under PACKAGE-2019-20 RRN-DIV-(09)
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	11.03.2021

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.98	9.65	9 Kn (min)
2	Marshal flow, mm	3.72	3.75	2 – 4
3	Percent air voids in Mineral Aggregate	14.35	13.35	13 – 15
4	Voids in Compacted Mix	3.89	3.63	3 – 6
5	Percent Voids filled with Bitumen	67.12	69.65	65 - 75
6	Density, g/cc	2.26	2.25	--

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Job No.: SCE/BBMP/RL/17/2020-2021

Date 15.02.2021

GRADATION FOR WMM

Client : **Executive Engineer,** RR Naga Division,BBMP, Bangalore.

Agency : **Sri. R Lokesh,** Contractor, Bangalore.

Name of Work Compreshensive development of roads and drains in Muthyalanagara, LC-4A, Mohankumarnagara, Sundar nagara and surrounding areas in ward no-17 under PACKAGE-2019-20 RRN-DIV-(09)

IS Code: :IS 2386 (Part 1):1963(RA 2011)

Date of Testing 15.02.2021

Material Type : Wet Mix Macadam

Oven Dry.Wt, grar 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	215	215	2.2	97.9	95-100
22.4	2504	2719	27.2	72.8	60-80
11.2	2214	4933	49.3	50.7	40-60
4.75	1895	6828	68.3	31.7	25-40
2.36	1157	7985	79.9	20.2	15-30
0.600	585	8570	85.7	14.3	8-22
0.075	1065	9635	96.4	3.6	0-5

Note:

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Asst. Executive Engineer
Yeshwanthpura Sub-Division
Bruhat Bangalore Mahanagara Palike

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Consultants and Engineers
(Building, Geo-Tech & Road Materials Testing Laboratory)

#B9-003, GANGA, Jnanabharathi Enclave,
Valagerahalli, Mysore Road, Bangalore 560059
Ph: 9448853634, 8762194386.
Email: sapiencebangalore@gmail.com

Job No.: SCE/BBMP/RL/17/2020-2021

Date 15.02.2021

GRADATION FOR WMM

Client Agency : **Executive Engineer,** RR Naga Division,BBMP, Bangalore.

Name of Work : **Sri. R Lokesh,** Contractor, Bangalore.

Compreshensive development of roads and drains in Muthyalanagara, LC-4A, Mohankumarnagara, Sundar nagara and surrounding areas in ward no-17 under PACKAGE-2019-20 RRN-DIV-(09)

IS Code: :IS 2386 (Part 1):1963(RA 2011)

Date of Testing 15.02.2021

Material Type : Wet Mix Macadam

Oven Dry.Wt, grar 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	203	203	2.0	98.0	95-100
22.4	2645	2848	28.5	71.5	60-80
11.2	2174	5022	50.2	49.8	40-60
4.75	1806	6828	68.3	31.7	25-40
2.36	1125	7953	79.5	20.5	15-30
0.600	566	8519	85.2	14.8	8-22
0.075	1025	9544	95.4	4.6	0-5

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Date 15.02.2021

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Agency : **Sri. R Lokesh,** Contractor, Bangalore.

Name of Work Compreshensive development of roads and drains in Muthyalanagara, LC-4A, Mohankumarnagara, Sundar nagara and surrounding areas in ward no-17 under PACKAGE-2019-20 RRN-DIV-(09)

IS Code: :IS 2386 (Part 1):1963(RA 2011)

Date of Testing 15.02.2021

Material Type : Wet Mix Macadam

Oven Dry.Wt, grar 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	215	215	2.2	97.9	95-100
22.4	2436	2651	26.5	73.5	60-80
11.2	2085	4736	47.4	52.6	40-60
4.75	1855	6591	65.9	34.1	25-40
2.36	1158	7749	77.5	22.5	15-30
0.600	975	8724	87.2	12.8	8-22
0.075	1063	9787	97.9	2.1	0-5

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Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	214	214	2.1	97.9	95-100
22.4	2516	2730	27.3	72.7	60-80
11.2	2063	4793	47.9	52.1	40-60
4.75	1815	6608	66.1	33.9	25-40
2.36	1145	7753	77.5	22.5	15-30
0.600	856	8609	86.1	13.9	8-22
0.075	1025	9634	96.3	3.7	0-5

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53	0	0	0	100	100
45	215	215	2.2	97.9	95-100
22.4	2465	2680	26.8	73.2	60-80
11.2	2085	4765	47.7	52.4	40-60
4.75	1875	6640	66.4	33.6	25-40
2.36	1152	7792	77.9	22.1	15-30
0.600	865	8657	86.6	13.4	8-22
0.075	1025	9682	96.8	3.2	0-5

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45	202	202	2.0	98.0	95-100
22.4	2463	2665	26.7	73.4	60-80
11.2	2065	4730	47.3	52.7	40-60
4.75	1865	6595	66.0	34.1	25-40
2.36	1152	7747	77.5	22.5	15-30
0.600	855	8602	86.0	14.0	8-22
0.075	1063	9665	96.7	3.3	0-5

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